

TABLE 1

Examples 1-15						
Formulation Example	Parts Oligomer A	Parts SR-499	Parts SR-306	Parts DAROCUR 1173	% 20° Gloss Retention	Standard Deviation
1	50.00	35.00	15.00	5	74.0	4.8
2	30.00	45.00	25.00	5	43.1	8.1
3	40.00	42.50	17.50	5	67.0	2.6
4	40.00	35.00	25.00	5	63.5	3.0
5	35.00	50.00	15.00	5	70.9	3.4
6	40.00	35.00	25.00	5	66.3	3.2
7	40.00	42.50	17.50	5	74.2	1.9
8	50.00	40.00	10.00	5	78.2	1.7
9	45.00	45.00	10.00	5	77.8	1.5
11	40.00	50.00	10.00	5	77.2	1.4
12	50.00	40.00	10.00	5	76.4	3.5
13	30.00	45.00	25.00	5	64.1	3.0
14	30.00	50.00	20.00	5	56.1	3.4
15	45.00	35.00	20.00	5	64.2	2.1

Example 16

A series of samples were prepared based in part on the above data for Examples 1-15. The Example 16 samples were made with 40 parts Oligomer A, 45 parts trifunctional acrylate (SR-499), 10 parts difunctional acrylate (SR-306), 0.3 parts wetting agent (FLUORAD FC-431) and photoinitiator. 5 parts of a photoinitiator such as the DAROCUR 1173 material or other photoinitiators were all used successfully including 3 parts benzophenone combined with 2 parts of either DAROCUR 1173 photoinitiator or IRGACURE 184 photoinitiator. These compositions were coated over Sealed PVC Tile that had an applied primer coat of CORNERSTONE floor sealer according to Coating Procedure A and cured according to Curing Procedure A. Abrasion resistance, scratch hardness, and strip times were determined according to the above Test Methods A, B and C. The % 20° gloss retention for these samples was consistently about 83%. Scratch hardness was about 1200 g. Strip time was less than 5 minutes.

Examples 17-30

Examples 17-30 were prepared and evaluated for abrasion resistance according to Test Method A. Analysis of the results indicates that formulations with reduced amounts of the SR-306 difunctional acrylate have the best durability. All samples contained 0.3 parts wetting agent (FLUORAD FC-431), and were coated onto PVC Tile. They were coated at 2.5 g/ft² (26.9 g/m²) using a Coating Procedure A and cured using Curing Procedure A. The compositions of the Examples and the abrasion resistance data are set forth in Table 2.

TABLE 2

Examples 17-30						
Formulation Example	Parts Oligomer B	Parts SR-499	Parts SR-306	Parts DAROCUR 1173	% 20° Gloss Retention	Standard Deviation
17	60	30	5	5	66.7	0.4
18	60	30	5	5	68.1	1.0
19	45	45	5	5	75.1	8.3
20	45	35	15	5	48.8	6.4

TABLE 2-continued

Examples 17-30						
Formulation Example	Parts Oligomer B	Parts SR-499	Parts SR-306	Parts DAROCUR 1173	% 20° Gloss Retention	Standard Deviation
21	45	30	20	5	51.2	4.3
22	41.25	41.25	12.5	5	62.3	1.1
23	45	45	5	5	73.4	2.2
24	45	30	20	5	60.7	1.9
25	30	45	20	5	7.6	5.2
26	30	60	5	5	72.9	2.3
27	37.5	37.5	20	5	56.1	4.1
28	30	52.5	12.5	5	66.2	4.5
29	30	60	5	5	69.0	8.7
30	52.5	30	12.5	5	71.0	3.8

Example 31

A series of samples were made based in part on the results of Examples 17-30. All of these samples comprised 30 parts Oligomer B, 65 parts trifunctional acrylate (SR-499), 0.3 parts wetting agent (FLUORAD FC-431) and 5 parts photoinitiator. As the photoinitiator, the DAROCUR 1173 photoinitiator was used successfully by itself as well as other photoinitiators including combinations of benzophenone and DAROCUR 1173 photoinitiator, and benzophenone and IRGACURE 184 photoinitiator. The samples were coated onto a substrate according to Coating Procedure A and cured according to Coating Procedure A. Abrasion Resistance, Scratch Hardness and Strip Time were determined for the cured coatings according to the Test Methods A, B, and C.

Using an initiator system of 5 parts DAROCUR photoinitiator and one additional part of benzophenone the abrasion resistance after a 15 seconds irradiation was up to 82% gloss retention at 20°. The typical scratch hardness of these formulations, when cast onto Sealed PVC Tile (sealed with a poly(vinylidene dichloride) primed polyester film floor sealer commercially available under the trade designation "TECHNIQUE" from S.C. Johnson, Milwaukee, Wis.) was 800-1000 g. When coated over conventional floor finishes, delamination was commonly observed at forces of as little as 200 g. Strip time from Sealed PVC Tile (when sealed with a floor finish available under the trade designation "CORNERSTONE" commercially available from Minnesota Mining and Manufacturing Company) was about 2-3 minutes.

Example 32

A series of samples were developed based in part on the results of Example 16. These samples comprised 40 parts Oligomer C, 45 parts trifunctional acrylate (SR-499), 10 parts difunctional acrylate (SR-306), 5 parts photoinitiator and 0.3 parts wetting agent (FLUORAD FC-431). The DAROCUR 1173 photoinitiator and other photoinitiators were all used successfully including combinations of benzophenone and DAROCUR 1173 photoinitiator, and benzophenone and IRGACURE 184 photoinitiator. The samples were coated onto a substrate according to Coating Procedure A and cured according to Coating Procedure A. Abrasion Resistance, Scratch Hardness and Strip Time were determined for the cured coatings according to the Test Methods A, B, and C. The abrasion resistance (% 20° Gloss Retention) was consistently 85%, the scratch hardness was 1300 g, and strip time from Sealed PVC Tile (sealed with a floor sealer commercially available under the trade designation